REMARKS/ARGUMENTS

Applicant has carefully reviewed and considered the Final Office Action mailed on October 31, 2007, and the references cited therewith.

Claims 1, 8, 17, 19, and 22-23 are amended, and no claims are canceled or added; as a result, claims 1-23 are now pending in this application.

§ 112 Rejection of the Claims

Claims 1-12 and 17-23 were rejected under 35 USC § 112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully traverses the rejection as follows.

With regard to independent claims 1 and 8, the Examiner states in section 3 of the October 31, 2007, Final Office Action that "the specification fails to specifically describe register is no longer valid for process use after the physical address space is released and before the process has released the virtual address space."

Applicant's independent claim 1, as currently amended, presently recites:

> register that the virtual address space, previously available to the process, is no longer valid for process use subsequent to when the physical address space is released and before when the process has released the virtual address space.

The specification of the present disclosure as originally filed supports "subsequent to when the physical address space is released and before when the process has released the virtual address space" in several locations. For example, the specification recites in paragraph 0016:

> In various embodiments, as a removable device is disconnected from the computing device the memory management system releases the physical address space associated with the removable device according to the operating system's semantics. If this occurs before the process that was allocated and/or assigned this virtual address space has released the virtual address space, then the program instructions execute to register in a virtual memory data structure associated with the process that the virtual address space, previously available to the process, is no longer valid for process use.

Further support can be found in paragraph 0054, which recites:

> And, the program instructions associated with the process can in their regular manner execute to <u>release the particular allocated virtual address space</u> at the process's request <u>subsequent to the memory mappable device being logically disconnected</u> from the computing device.

As supported in the paragraphs just recited, a computing device according to the present disclosure can, "release a physical address space associated with the virtual address space when the device has a connection removed from the computing device", as also recited in Applicant's independent claim 1, as originally presented.

Independent claim 8, as currently amended, presently recites:

> register in a virtual memory data structure of the memory management system that the virtual address space is no longer available to the process <u>subsequent to when the physical address space is released and before when</u> the process has released the virtual address space.

With regard to dependent claim 17 and independent claim 19, the Examiner states that "the specification fails to specifically describe the virtual address space associated with the process is not available for use <u>after the mapping of the object to physical memory has been removed</u>."

Applicant's dependent claim 17, as currently amended, presently recites:

> register in the virtual memory data structure of the process that the <u>virtual address space</u> associated with the process <u>is not available for use subsequent to when the mapping of the object to physical memory has been removed</u>.

The specification of the present disclosure as originally filed supports "virtual address space associated with the process is not available for use subsequent to when the mapping of the object to physical memory has been removed" in several locations. For example, the specification recites in paragraphs 0048:

> And, the program instructions can execute to allow the process to <u>unmap the virtual address space subsequent to the release of the physical address space</u>.

Paragraph 0048 also recites:

> Meanwhile, the program instructions can execute to <u>remove a mapping of the object to physical memory</u>. Additionally, the program instructions execute to <u>register in the virtual memory data structure of the process</u>, e.g., shown in FIG. 3, <u>that the virtual address space associated with the process is not available for use</u>.

Applicant's independent claim 19, as currently amended, presently recites:

> providing an indication in the virtual memory data structure that <u>a virtual address space is no longer available</u> for use by the process, <u>when the object is removed from physical memory</u>, without removing the representation of the object from the virtual memory data structure.

The specification of the present disclosure as originally filed supports "a virtual address space is no longer available for use by the process, when the object is removed from physical memory" in several locations. For example, the specification recites in paragraphs 0051-0052:

> The method further includes <u>removing the object from physical memory when</u> a removable memory mappable device is logically disconnected from the computing device as shown in block 430.
> At block 440, the method further includes <u>providing an indication in the virtual memory data structure that a virtual address space is no longer available for use</u> by the process. According to embodiments of the invention, the method in block 440 includes providing an indication without removing the representation of the object from the virtual memory of the structure.

With regard to independent claims 22 and 23, the Examiner states that "the specification fails to specifically describe to register that the virtual space is not available to the process in a manner after releasing the physical address space before the process has released the virtual address space."

Applicant's independent claim 22, as currently amended, presently recites:

> <u>subsequent to releasing the physical address space and before</u> the process has released the virtual address space, registering that the virtual address space is not available to the process in a manner which does not violate semantics of an operating system.

The specification of the present disclosure as originally filed supports "subsequent to releasing the physical address space and before the process has released the virtual address space" in several locations. For example, the specification recites in paragraph 0016:

> In various embodiments, as a removable device is disconnected from the computing device the memory management system releases the physical address space associated with the removable device according to the operating system's semantics. If this occurs before the process that was allocated and/or assigned this virtual address space has released the virtual address space, then the program instructions execute to register in a virtual memory data structure associated with the process that the virtual address space, previously available to the process, is no longer valid for process use.

Further support can be found in paragraph 0054, which recites:

> And, the program instructions associated with the process can in their regular manner execute to release the particular allocated virtual address space at the process's request subsequent to the memory mappable device being logically disconnected from the computing device.

As supported in the paragraphs just recited, a method for memory management according to the present disclosure can perform, "releasing a physical address space when the device has a logical connection removed from the computing device", as also recited in Applicant's independent claims 22 and 23, as originally presented.

In addition, Applicant's independent claim 23, as currently amended, presently recites:

> subsequent to releasing the physical address space and before the process has released the virtual address space, registering in a virtual memory data structure associated with the process that the virtual address space is no longer available to the process in a manner which does not violate semantics for an operating system the computing device.

As such, Applicant respectfully submits that claims 1, 8, 17, 19, and 22-23, as currently amended, comply with the written description requirement of 112, first paragraph. Accordingly, Applicant respectfully requests reconsideration and withdrawal

of the 112 rejection of claims 1, 8, 17, 19, and 22-23, as currently amended, as well as those claims that depend therefrom.

§ 102 Rejection of the Claims

Claims 13-16 were rejected under 35 USC § 102(e) as being anticipated by Browning et al. (U.S. Pub. No. 2004/0064669). Applicant respectfully traverses the rejection as follows.

Applicant does not admit that the Browning reference is indeed prior art and reserves the right to swear behind at a later date. Nonetheless, in the interest of advancing prosecution thereof, Applicant respectfully submits that the elements and limitations of the claims of the present disclosure are distinguishable from the teachings of the Browning reference for at least the following reasons.

The Browning reference appears to describe, "invalidating specified pretranslations maintained in a data processing system which maintains decentralized copies of pretranslations." (Abstract). The Browning reference appears to describe pretranslations in paragraph 0006 as:

> To translate is the process of looking up from a centralized record the physical address to which a particular virtual address is mapped. Thus, a pretranslation is obtained using the centralized record. A pretranslation is a copy of the translation. The pretranslation may be stored, such as with a virtual buffer, for later use in order to avoid the process of translation.

Thus, the Browning reference appears to describe storing a number of pretranslations, such as with a virtual buffer, for later use in order to avoid the process of translation, which also avoids accessing the virtual address space. Hence, the reference does nor show unmapping a virtual address space for a process in a manner which does not violate semantics for an operating system of the computing device when a removable memory mappable device associated with the process is logically disconnected. More generally, Applicant has carefully reviewed the Browning reference and the reference does not appear to show the element "when a removable memory mappable device associated with the process is logically disconnected."

In contrast, Applicant's independent claim 13, as previously presented, recites:

> means for <u>unmapping a virtual address space</u> for a process in a manner which does not violate semantics for an operating system of the computing device <u>when a removable memory mappable device associated with the process is logically disconnected</u>.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 13, as previously presented, is not present in the Browning reference. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 102 rejection of independent claim 13, as well as those claims that depend therefrom.

§ 103 Rejection of the Claims

Claims 1-12 and 17-23 were rejected under 35 USC § 103(a) as being unpatentable over Browning et al. (U.S. Pub. No. 2004/0064669) in view of Arimilli et al. (U.S. Patent No. 6,907,494). Applicant respectfully traverses the rejection as follows.

Similar to the Browning reference, Applicant does not admit that the Arimilli reference is indeed prior art and reserves the right to swear behind at a later date. Nonetheless, in the interest of advancing prosecution thereof, Applicant respectfully submits that the elements and limitations of the claims of the present disclosure are distinguishable from the teachings of the Browning and Arimilli references for at least the following reasons.

The Examiner states in section 7 of the October 31, 2007, Final Office Action that "Browning differs from the claimed invention in not specifically teaching to register that the virtual address space is no longer valid for process use after the physical address space is released." The Examiner went on to state that the Arimilli reference teaches such.

The Arimilli reference appears to describe, "A processor contains a move engine and a memory controller contains a mapping engine that, together, transparently <u>reconfigure physical memory</u> to accomplish addition, subtraction, or replacement of a

memory module." (Abstract). The reference further appears to describe in column 7, lines 52-57:

> Processor unit 10 notifies move engine 28 and mapping engines 26, 36, 46 that <u>memory module M2 is being removed from physical memory</u> 22. <u>Move engine immediately selects the remaining module</u> or modules that will be used <u>to store the data contained in memory module M2</u>.

However, from the Applicant's review, the Arimilli reference does not appear to teach instructions that <u>register that a virtual address space</u>, previously available to a process, <u>is no longer valid for process use subsequent to when a physical address space is released</u> and before when the process has released the virtual address space.

In contrast, Applicant's independent claim 1, as currently amended, presently recites:

> <u>register that the virtual address space</u>, previously available to the process, <u>is no longer valid for process use subsequent to when the physical address space is released</u> and before when the process has released the virtual address space.

Independent claim 8, as currently amended, presently recites:

> <u>register</u> in a virtual memory data structure of the memory management system <u>that the virtual address space is no longer available to the process subsequent to when the physical address space is released</u> and before when the process has released the virtual address space.

Independent claim 19, as currently amended, presently recites:

> <u>providing an indication</u> in the virtual memory data structure <u>that a virtual address space is no longer available for use by the process, when the object is removed from physical memory</u>, without removing the representation of the object from the virtual memory data structure.

Independent claim 22, as currently amended, presently recites:

> <u>subsequent to releasing the physical address space</u> and before the process has released the virtual address space, <u>registering that the virtual address space is not available to the process</u> in a manner which does not violate semantics of an operating system.

In addition, independent claim 23, as currently amended, presently recites:

subsequent to releasing the physical address space and before the process has released the virtual address space, registering in a virtual memory data structure associated with the process that the virtual address space is no longer available to the process in a manner which does not violate semantics for an operating system the computing device.

As such, Applicant respectfully submits that the Browning and Arimilli references do not describe, teach, or suggest, either individually or in combination, each and every element and limitation of independent claims 1, 8, 19, and 22-23, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of independent claims 1, 8, 19, and 22-23, as currently amended, as well as those claims that depend therefrom.

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CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Edward J. Brooks III at (612) 236-0120.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

CERTIFICATE UNDER 37 CFR §1.8: The undersigned hereby certifies that this correspondence is being transmitted to The United States Patent and Trademark Office facsimile number (571) 273-8300, on this _11_ day of _December_ 2007.

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